Extreme Heat & Your Solar Setup

A friendly guide for vans, motorhomes, caravans, boats & off-grid systems

When the temperature rises, your solar system can be working harder than usual — and extreme heat can affect **solar panels, batteries, charge controllers, inverters, cables and connections**.

More sunshine doesn't always mean a happier solar system!

A few simple checks can help keep your system **safe, cool and working efficiently** during a heatwave.

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1. Solar panels get VERY hot

Solar panels love sunlight, but they don't love extreme temperatures.

As panel temperature increases, their electrical performance can decrease. Your panels may therefore produce **less power than you might expect on a very hot, sunny day**.

Keep an eye on:

- Unusual drops in solar production
- Damage, cracks or lifting around the panels
- Loose mounting rails or fixings
- Cables that appear damaged or degraded

Don't worry if your panel output drops slightly in extreme heat — this can be completely normal.

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2. Batteries need extra attention

This is one of the most important areas during extreme heat.

Batteries can become very hot, particularly when installed in enclosed areas such as under seats, inside cupboards, lockers or compartments.

Check that:

- Your battery has adequate ventilation where required
- Nothing is covering or insulating the battery unnecessarily
- The battery isn't sitting in direct sunlight
- Battery temperature remains within the manufacturer's recommended operating range

⚠ Lithium batteries

Many lithium batteries have built-in protection against charging at temperatures outside their safe operating range, but **don't rely on this as your only protection**.

Always follow the battery manufacturer's temperature limits.

Never deliberately charge a battery that is too hot.

If your battery management system (BMS) has stopped charging because of temperature, allow the battery to cool naturally and investigate why it became excessively hot.

Lead-acid batteries

Extreme heat can also shorten the life of lead-acid batteries and increase water loss in batteries where electrolyte maintenance is required.

Always follow the battery manufacturer's instructions.

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3. Check your cables and connections

Heat can make an existing problem worse.

A poor connection, loose terminal or undersized cable can generate additional heat when current is flowing.

Before or during a heatwave, check for:

- Loose connections
- Damaged or melted insulation
- Discoloration around terminals or connectors
- Corrosion
- Signs of overheating
- Cables rubbing against sharp edges
- Cables that have become brittle or damaged

⚠ Something doesn't look right?

If a cable, connector or terminal is **hot, discolored, melted or smells of burning**, switch the system off safely if you can and have it checked.

Don't simply replace the fuse and carry on.

4. Don’t forget your charge controller

Your MPPT or PWM charge controller can also become very warm during periods of high solar production.

Make sure it has **plenty of ventilation** and isn’t surrounded by items that could trap heat.

Avoid installing or covering it inside a sealed, unventilated space unless the manufacturer’s installation instructions specifically allow it.

If your controller is showing a temperature warning or repeatedly shutting down, **don’t ignore it**.

Allow it to cool and check the installation and manufacturer’s guidance.

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5. Give your inverter some breathing space

Inverters can generate considerable heat, particularly when powering high-demand appliances.

During a heatwave:

- Keep ventilation openings clear
- Don’t cover the inverter
- Avoid storing items directly around it
- Don’t run high-power appliances unnecessarily for long periods
- Check for unusual noises, smells or temperature warnings

If your inverter repeatedly shuts down because of temperature, let it cool before trying again.

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6. Vans, motorhomes & caravans

Your vehicle can become **much hotter inside than the outside temperature**, particularly when parked in direct sunlight.

Where possible:

✔ **Park in shade**

✔ **Keep equipment ventilated**

✔ **Keep battery compartments and electrical equipment clear**

✔ **Consider ventilation through the vehicle**

✔ **Avoid leaving heat-sensitive equipment in direct sunlight**

And remember — a cupboard that feels reasonably warm in the morning can become extremely hot by the afternoon.

7. Boats

Boat electrical systems can be particularly vulnerable to heat because equipment is often installed in enclosed lockers or compartments.

Check that:

- Battery compartments are appropriately ventilated
- Electrical equipment has adequate airflow
- Cables and terminals are dry, secure and corrosion-free
- No equipment is sitting in direct sunlight
- Heat isn't becoming trapped around the inverter or charge controller

Pay particular attention to corrosion and connections. A connection that is already compromised can become a bigger problem when the system is working hard.

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8. Off-grid cabins & sheds

Outbuildings can become incredibly hot during prolonged sunshine.

If your solar equipment is installed inside a shed, cabin or other enclosed space, check the temperature around:

- Batteries
- Inverters
- Charge controllers
- Fuses and fuse holders
- Cable connections

Good ventilation can make a significant difference.

Don't assume that because the equipment is indoors, it's protected from extreme temperatures.

Know the warning signs

Stop and investigate if you notice:

🔥 Burning or unusual smells
🔥 Melted or discolored cables/connectors
🔥 Excessive heat from a cable or connection
🔥 Battery swelling or visible damage

🔥 Repeated inverter or charge-controller shutdowns
🔥 Unusual noises from electrical equipment
🔥 Smoke or signs of scorching
🔥 Battery temperature warnings

If you see smoke, signs of fire or severe overheating, move away from the equipment and seek appropriate emergency assistance. Do not put yourself at risk trying to investigate an electrical fault. Never use water on electrical fires.

A quick heatwave checklist

Before the temperature really climbs:

☐ Check your battery and its ventilation
☐ Check cables and connections
☐ Check fuses and fuse holders
☐ Make sure your MPPT/PWM controller has airflow
☐ Make sure your inverter has airflow
☐ Remove anything covering electrical equipment
☐ Check for damaged or corroded connections
☐ Keep equipment out of direct sunlight where possible
☐ Check your battery manufacturer's temperature limits
☐ Check your inverter and charge-controller manufacturer's guidance

And finally...

Don't panic if your solar system produces slightly less power during extreme heat. That's normal.

The important thing is to keep your equipment **properly installed, ventilated and within the manufacturer's recommended operating temperatures**.

If something looks, smells or feels wrong, **don't ignore it.**

Stay cool, stay safe and enjoy the sunshine!

This guide is intended as general practical advice and does not replace the installation, operating or safety instructions supplied by your equipment manufacturer. If you're unsure about the condition or safety of your solar installation, consult a suitably qualified professional